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Environmental Action Program for Puget Sound

(U.S.) Environmental Protection Agency
Seattle, WA

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The water quality of Puget Sou[illegible]n estuary of immense value and importance to the Pacific Northwest, is threa[illegible]by contamination with toxic and conventional pollutants. Past pollution co[illegible]forts, while addressing some pollution sources, have lacked the integra[illegible]tem-wide approach needed to address current and anticipated problems. The Puget Sound Environmental Action Program presents Region 10's plan for addressing the problems of Puget Sound. The program describes a geographic, multi-media approach to problem identification, control and enforcement. Success in developing and implementing the many initiatives described in this program depends on the close cooperation between EPA Region 10, the Washington State Department of Ecology, and the Puget Sound Water Quality Authority. The cooperation among the REgion'a air, water, and hazardous waste programs is needed as well. Technical, financial, and staff support from Headquarters will hlep Region 10 carry out tis responsibilities under the program.

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United States
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Region 10
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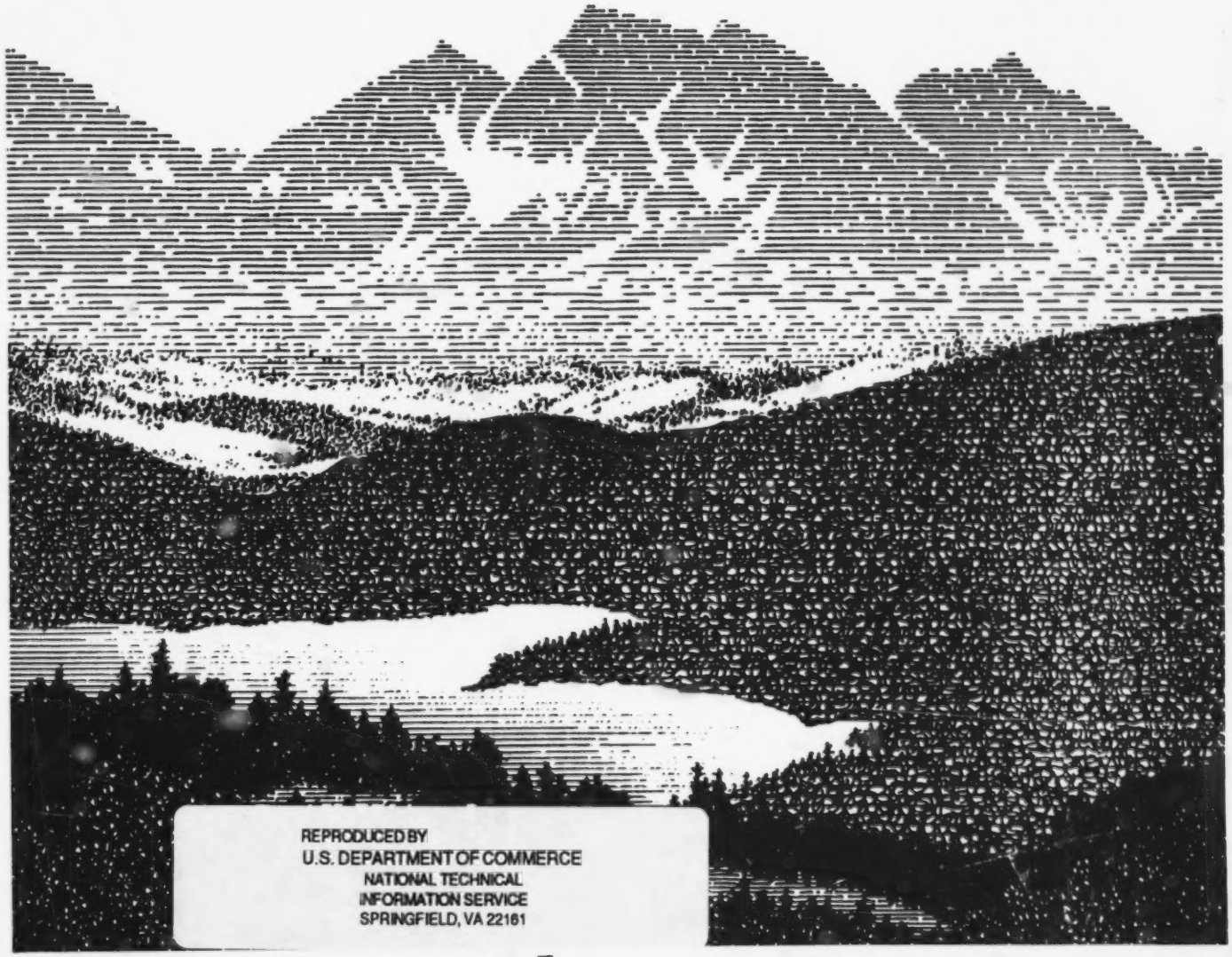
EPA

Environmental Action Program For Puget Sound



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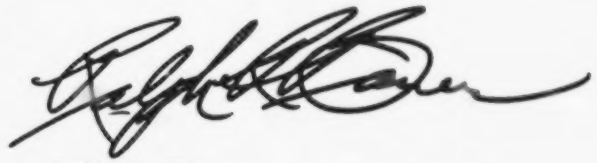
Letter to the Administrator

I am pleased to submit Region 10's Environmental Action Program for Puget Sound. The purpose of this document is to communicate the problems threatening Puget Sound and our strategy for addressing them.

The Puget Sound Action Program is the result of the efforts of: EPA Office of Puget Sound, the Program, Planning, and Evaluation Branch, EPA's Regional program offices in consultation with the Washington State Department of Ecology and the Puget Sound Water Quality Authority. In developing the Program, we have attempted to be responsive to the interests of several Headquarters offices -- Office of Enforcement and Compliance Monitoring, Policy Planning and Evaluation, and the Office of Estuary Protection -- as well as the needs of the many organizations involved in implementing it.

The Puget Sound Action Program will serve as a guide for our activities in Puget Sound over the next three to five years. Space does not permit us to convey in detail the level of effort these activities will entail. Some activities may be changed to reflect the Puget Sound Water Quality Authority's Plan, to be completed by January 2, 1987. Furthermore, as time progresses, the plan will be updated in response to new and emerging information.

The strategies, as outlined in our plan, constitute an ambitious and challenging endeavor. To be successful, it will require the support of EPA, State and local governments, and the citizenry of the State of Washington.



Ralph R. Bauer
Acting Regional Administrator

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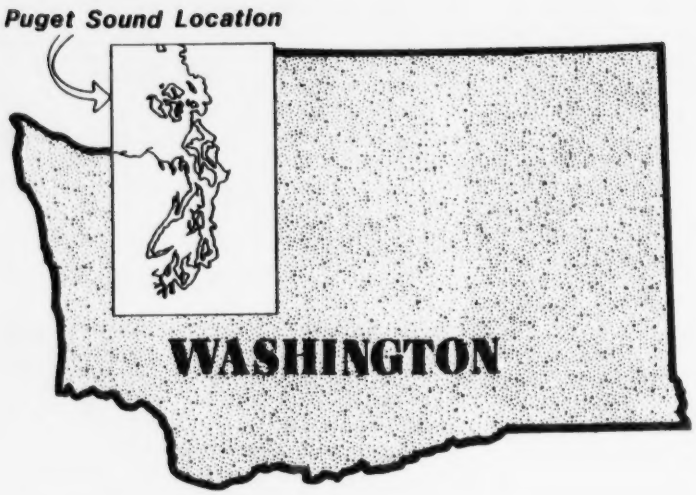
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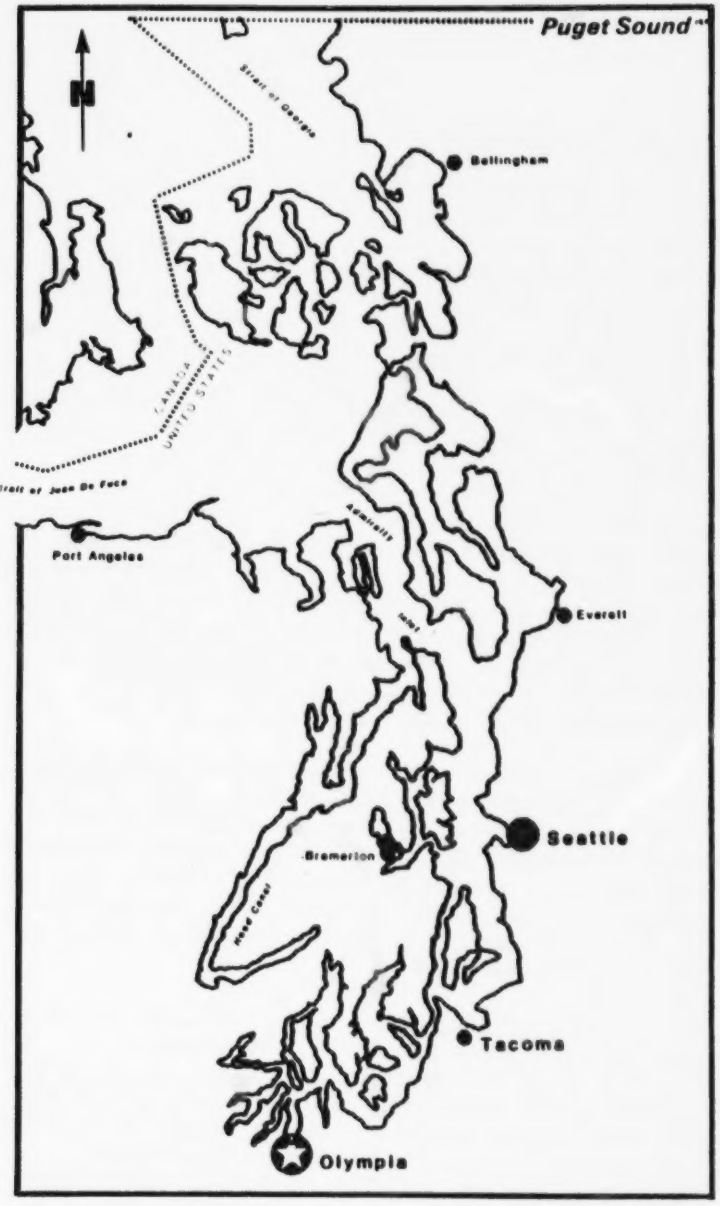
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Executive Summary

The water quality of Puget Sound, an estuary of immense value and importance to the Pacific Northwest, is threatened by contamination with toxic and conventional pollutants. Past pollution control efforts, while addressing some pollution sources, have lacked the integrated system-wide approach needed to address current and anticipated problems. The Puget Sound Environmental Action Program presents Region 10's plan for addressing the problems of Puget Sound. The program describes a geographic, multi-media approach to problem identification, control, and enforcement. Success in developing and implementing the many initiatives described in this program depends on the close cooperation between EPA Region 10, the Washington State Department of Ecology, and the Puget Sound Water Quality Authority. The cooperation among the Region's air, water, and hazardous waste programs is needed as well. Technical, financial, and staff support from headquarters will help Region 10 carry out its responsibilities under the program.

Puget Sound's 2,200 square miles of bays and inlets and over 2,000 miles of shoreline is one of the most biologically productive and recreationally important estuarine areas in the country. Its shorelines, waters, and rich marine life symbolize the quality of life to 2.5 million people who populate its borders. The Sound is also the center for the Region's commercial, maritime, and industrial activities.

Studies by EPA, NOAA, and others have revealed that highly toxic and persistent pollutants are contaminating the Sound's environmental and biological systems. While much of the focus has been on the acute and immediate problems of urban bays, concern is growing over the long-term, cumulative impacts of these contaminants on the health of the Sound. This concern is in response to evidence that toxic and conventional contaminants are appearing at all levels of the food chain,

and that these contaminants are being found in areas of the Sound far removed from urban/industrial centers. Furthermore, concern over human health risks posed by these contaminants in Puget Sound seafood has resulted in the closure of many commercial and recreational shellfish harvesting areas and in issued warnings against eating fish caught in several urban bays.

Executive Summary

The Puget Sound Environmental Action Program details Region 10's response to these problems. Five major objectives and a series of activities to be carried out to achieve each objective make up the program. The goal is to expeditiously eliminate or significantly reduce discharges of specifically targeted problem pollutants. The action program will result in a comprehensive, integrated approach for addressing the pollution problems of Puget Sound.

The first objective calls for a fuller understanding of the toxicant-related problems in Puget Sound indicated by adverse biological effects and bioaccumulation. Current knowledge about the Sound is being mapped. Surveys and studies will be undertaken to fill in the gaps of our knowledge about the nature, location, extent, and severity of the Sound's pollution problems. While the focus will be on the urban bays where the most severe problems are located, we will also undertake studies to assess what will be the long-term effects of toxicants on the Sound's biological systems. The risks to human health from consumption of contaminated Puget Sound seafood will also be studied and assessed.

The second objective will reduce the input of problem chemicals in Puget Sound to safe levels, particularly in the urban bays. A major emphasis of this objective is to develop and implement a program to identify and reduce discharges of "chemicals of concern." This approach will target key dischargers of "chemicals of concern" for toxics control. Ambient and biomonitoring requirements will also be added to these discharge permits. Storm drains and combined sewer overflows (CSO's) are also a major source of pollution in Puget Sound. These sources of pollution will be addressed through the development and implementation of strategies for volume reduction and permitting. Other activities under this objective include: implementing Urban Bay Action Plans, tracking municipal compliance with secondary treatment requirements, and completing the dredge spoil disposal analysis.

The purpose of the third objective is to target compliance and enforcement efforts under a geographic enforcement initiative to reduce and deter inputs of problem pollutants ("chemicals of concern") into Puget Sound. These efforts are the key to the success of our program to clean-up and protect Puget Sound. Emphasis will be placed on urban bays and toxic discharge controls. Key activities include identifying unregulated dischargers and bringing them into compliance; stepped up monitoring and inspection of regulated dischargers; employing Urban Bay Action Teams to carry out enforcement and compliance strategies developed for priority urban bays; use of criminal enforcement capabilities; and cleaning up existing hazardous waste sites.

The fourth objective calls for the design and implementation of a comprehensive ambient water quality monitoring program. This objective responds to the need for a comprehensive Sound-wide monitoring program. This would allow for better tracking of clean-up progress and a means for identifying emerging problems.

The final objective calls for the development of management tools, institutional structures, and long range program support to clean up Puget Sound. A priority under this objective is to develop and implement protocols and data management tools to assure that the information collected on Puget Sound is of high quality and that it is efficiently managed for the greatest use. Other initiatives under this objective include the establishment of a Puget Sound Institute to focus and coordinate long-term Puget Sound research at the University of Washington, and the fostering of public understanding and participation in Puget Sound initiatives.

EPA Region 10 is responsible for many of the activities described in the Puget Sound Action Program. These activities will require an extensive commitment of the Region's resources. However, our resources are limited and in order to achieve our objectives we will need the support of headquarters. We have identified the following areas where headquarters could provide valuable assistance:

1) **Support Toxic Control Activities** through developing biomonitoring and toxic discharge limits for NPDES permits, and providing training and enforcement support for state agencies.

2) **Support the Development of Regional Sediment Criteria** by providing for better coordination and support between regional and headquarters sediment criteria efforts and support for setting discharge limits to meet interim sediment quality values.

3) **Support Development of Enhanced Biomonitoring Tools** by providing funding or technical assistance for development of chronic bioassays and for identification of pollution sensitive west coast species for use in ambient and biomonitoring.

4) **Support Toxic Hotspot Remedial Action Pilot Project** by providing funds to support a dredging project for the removal of a toxic hotspot in Puget Sound.

5) **Streamline Enforcement referral process** by allowing the Region to tailor the level of referral support on a case-by-case basis.

6) **Loan headquarter's staff to Region** where they could provide support in writing NPDES permits, 308 letters, and in writing defensible biomonitoring requirements into permits. This would be extremely helpful to Region 10 and would provide a short term rotational assignment for headquarter's staff.

7) **Increase commitment for regional staff by headquarters.** Headquarters currently supports only one of the four staff positions in the Office of Puget Sound (OPS). While the Region has supported the other three positions, anticipated cutbacks in FY '87 may prevent the region from doing so next year. Headquarters support for these positions would ensure successful implementation of the Environmental Action Program for Puget Sound by OPS.

Problem Statement

Environmental Problems

Puget Sound is one of the most biologically productive and recreationally important estuarine areas in the United States. The 2,200 square miles of bays and inlets and over 2,000 miles of shoreline support a rich and diverse commercial and sport fishery. Much of the commerce, industry, and tourism in the Northwest centers on Puget Sound. Its shorelines, waters, and marine life symbolize the quality of life in the Northwest.

The quality of Puget Sound and the beneficial uses that it supports have been threatened by toxic and conventional pollutants. Studies have revealed that pollutants have contaminated the Sound's environment and impacted its biological communities.

Puget Sound receives wastes from approximately 2.5 million people as well as from an array of industries. Wastes are directly discharged to the Sound from publicly owned treatment works and from facilities associated with food processing, construction, chemical manufacturing, marine industries, wood finishing, metal and petroleum refining, and from agricultural and forest practices. Erosion, urban and rural runoff, and atmospheric emissions also contribute contaminants. Many of these wastes contain toxic and hazardous materials such as PCB's, PAH's, mercury, cadmium, arsenic, lead, and potentially harmful pathogens.

Evidence of degradation of the Sound's environment and biological systems has been observed at many levels:

- The sediments of urban bays and harbors contain highly toxic and persistent materials. Sediments contain high concentrations of PCBs, aromatic hydrocarbons, chlorinated butadiens, and heavy metals.

- Benthic communities in urban bays are showing signs of stress. Communities were found to be of low diversity and to be dominated by a few species.

- Pollution in sediments has caused deformities in and death of shellfish and fish embryos, and has impaired the development of benthic worms.

- Tissues and organs of bottom-dwelling fish of urban bays exhibit higher than expected incidences of lesions and contain elevated levels of toxics. Between 15 and 89% of the English Sole in urban bays had liver lesions and other abnormalities, while the rate for English sole from Carr Inlet, a reference area, was zero percent.

- PCBs and mercury are found in marine birds and mammals. Harbor seals of the south Sound area have concentrations of PCBs higher than almost any other seal population in the world.

- Levels of bacterial contaminants in shellfish beds of rural bays are elevated. Forty-one percent of the commercial shellfish harvesting areas in Puget Sound are closed and 10% are conditionally approved for commercial harvest.

- Paralytic shellfish poisoning has spread beyond historical boundaries. There are indications that it is associated with elevated nutrient loading.

- Recent studies by Battelle Laboratories and NOAA have found pollutants in the microlayer of the water column in the waters of Elliott Bay, Commencement Bay, and Port Angeles Harbor at levels high enough to kill fish eggs, cause chromosomal damage in fish embryos, and slow growth of fish cells. Hatch success rates of fish eggs held in water samples

taken from these bays ranged from 0 to 38%, and of those that did hatch many had deformed spines. These rates compare to a rate of 85-90% for eggs held in water from Sequim Bay, an unpolluted area.

Presence of contaminants in the food chain has raised concern over the potential human health risks posed by consuming Puget Sound seafood. Shellfish exposed to harmful pathogens and, in urban bays, to toxic contaminants have caused state health officials to close many areas to commercial and recreational harvest. Bottom-dwelling fish in urban bays are contaminated with toxic and carcinogenic substances. State health officials have issued warnings against consuming seafood caught in several urban bays as a result of a cancer risk assessment.

While urban bays have been the focus of much of the studies on Puget Sound's pollution problems, there is evidence that heavy metals and other pollutants are showing up in the sediments of embayments far removed from urban development and industrialized activity. This factor along with the presence of toxic contaminants in the upper levels of the food chain have prompted concern over the cumulative impacts of pollution on the long-term health of the Sound. This concern is based on the recognition that large areas of the Sound are poorly flushed and that its assimilative capacity is limited. Data indicates that most of the pollutants entering the Sound remain in the system.

Apart from the impacts on marine organisms and human health, pollution may also impair the quality of life associated with Puget Sound. Great value is placed on Puget Sound's waters, beaches and marine life. These are, however, the very assets that are in danger of being severely altered from the contamination of the Sound by conventional and toxic pollutants.

ACTIONS TO DATE

Growing public concern over the condition of Puget Sound has resulted in several initiatives for action. Agencies at all levels of government have recognized that traditional methods of pollution control, while they have

improved water quality, have fallen short of the integrated system-wide approach needed for current and anticipated environmental problems. Initiatives undertaken include:

- Establishment of the Puget Sound Water Quality Authority by the State of Washington to develop and oversee a comprehensive water quality management plan for Puget Sound.

- Creation of the Puget Sound Initiative, (now the Puget Sound Estuary Program), to coordinate the efforts of federal, state, and local agencies having regulatory, research, and resource management responsibilities in Puget Sound in order to develop strategies to address problems in the Sound.

- Washington State Department of Ecology's Shellfish Strategy.

- Puget Sound Dredge Disposal Analysis is currently being carried out through the joint efforts of COE, EPA, and the Washington State Departments of Ecology and Natural Resources.

- Washington State Department of Ecology's South Sound Study.

Specific efforts by EPA to date include:

- Development of "action plans" for urban bays where the problems are most severe. In 1985 the focus has been on Commencement Bay, Elliott Bay, and Everett Harbor.

- Working with the COE to develop criteria for environmentally safe levels of contaminants in marine sediment.

- Working with the State of Washington to quantify the amounts of pollutants entering the Sound and to reduce inputs to acceptable levels through NPDES permits and by developing new control strategies.

- Field studies with NOAA in Elliott Bay and Commencement Bay to determine the extent of transport of pollutants to the central basin of the Sound.

EPA is also supporting studies to quantify the total loading of pollutants to the Sound by source, type, and amount. From this will be developed a model to relate source inputs to depositional areas, help evaluate the nature and extent of existing problems, develop integrated abatement and protection programs, and forecast future water quality impacts.

Summary of Objectives

1. Know and understand the toxicant-related problems in Puget Sound as indicated by adverse biological effects and bioaccumulation.

We know that organisms can be harmed, both acutely and chronically, upon exposure to chemicals, but we do not possess a clear understanding of routes of contamination or sublethal effects. It is suspected that the tissue of fish and shellfish caught in the Sound may contain potentially harmful levels of chemical contaminants. Whether the consumption of these organisms poses a threat to human health is not known, but recent studies indicate that more advanced species which feed on marine organisms are accumulating potentially carcinogenic chemicals in their tissues. To ensure the protection both of the biological resources and human health, more information is needed to adequately characterize and understand toxicant-related problems in Puget Sound.

Much of the information needed will be generated through field and laboratory investigations. The urban bay toxics action programs will provide extensive empirical data about site specific biological impacts and possible sources of the impacts. Lab studies will identify the chemicals or groups of chemicals responsible for problems observed in the field. To address human health issues, a risk assessment will be conducted using chemical concentration data collected from Puget Sound seafood. Development of an environmental atlas, which identifies sources of pollution and current environmental conditions, will provide a common reference for agencies focusing action on protecting the Sound.

2. Reduce the input of problem chemicals to Puget Sound to safe levels, especially in urban bays.

Chemical contamination in Puget Sound has been identified as an issue of priority concern. In recent years significant levels of toxic contaminants have been discovered in the water and sediments of urban bays. There is growing concern that certain areas, far removed from urban or industrial activity, may also be sinks for contaminants discharged miles away.

Summary of Objectives

As a means of reducing toxic contamination in Puget Sound, the agency will continue to fund toxics action programs in priority urban embayments and to conduct surveys to identify problems in non-urban areas. The programs will emphasize intensive field surveys to characterize environmental conditions and biological impact, and will be combined with site investigations designed to identify and control sources of pollution. Enhanced permit requirements, increased enforcement activity, and the development of tools for regulating sediment contamination will reduce, and eventually prevent, the further addition of toxic substances to the Sound.

3. Target compliance and enforcement efforts to reduce and deter inputs of problem pollutants.

In order to more effectively control the inputs of contaminants to Puget Sound, a comprehensive program, known as the Geographic Enforcement Initiative (GEI), is being developed to coordinate and focus increased emphasis on permitting, compliance, and enforcement activities. The GEI brings inspection resources from numerous programs as well as an administrative, civil and criminal focus for enforcement activities on the Sound. To enhance the effectiveness of the GEI, new regulatory tools are being developed. Use of these tools, including discharge permits for storm drains and control of CSOs, will greatly improve the agency's ability to characterize discharges and to ensure monitoring and control of toxic substances entering the estuary.

4. Design and implement a comprehensive monitoring program.

Design and implementation of an integrated, Puget Sound estuary-wide monitoring program will enable EPA to more accurately assess current conditions in Puget Sound. This effort will result in an improved ability to identify potential problems, to take action before significant adverse impacts occur, and to determine how and to what extent remedial and abatement actions have improved environmental quality. The monitoring program which is being developed will build on existing programs through the coordination and enhancement of numerous, but currently fragmented, programs at the federal, state and local level.

5. Develop management tools, institutional structure, and long range program support to clean up Puget Sound.

In the past few years, significant improvements have been made in the technical and institutional management of the Sound, and in coming years this momentum will be continued. Significant emphasis is being placed on the coordination and management of Puget Sound activities through participation on interagency management and technical advisory committees. Standard protocols defining acceptable levels of quality control for the collection and analysis of Puget Sound data are currently being developed and wide adoption and use of these protocols is expected. The development of an integrated Puget Sound data and information management system has begun and should improve our ability to identify, predict, and prevent environmental problems.

OBJECTIVES ARE TO:

1. Know and understand the toxicant-related problems in Puget Sound as indicated by adverse biological effects & bioaccumulation.

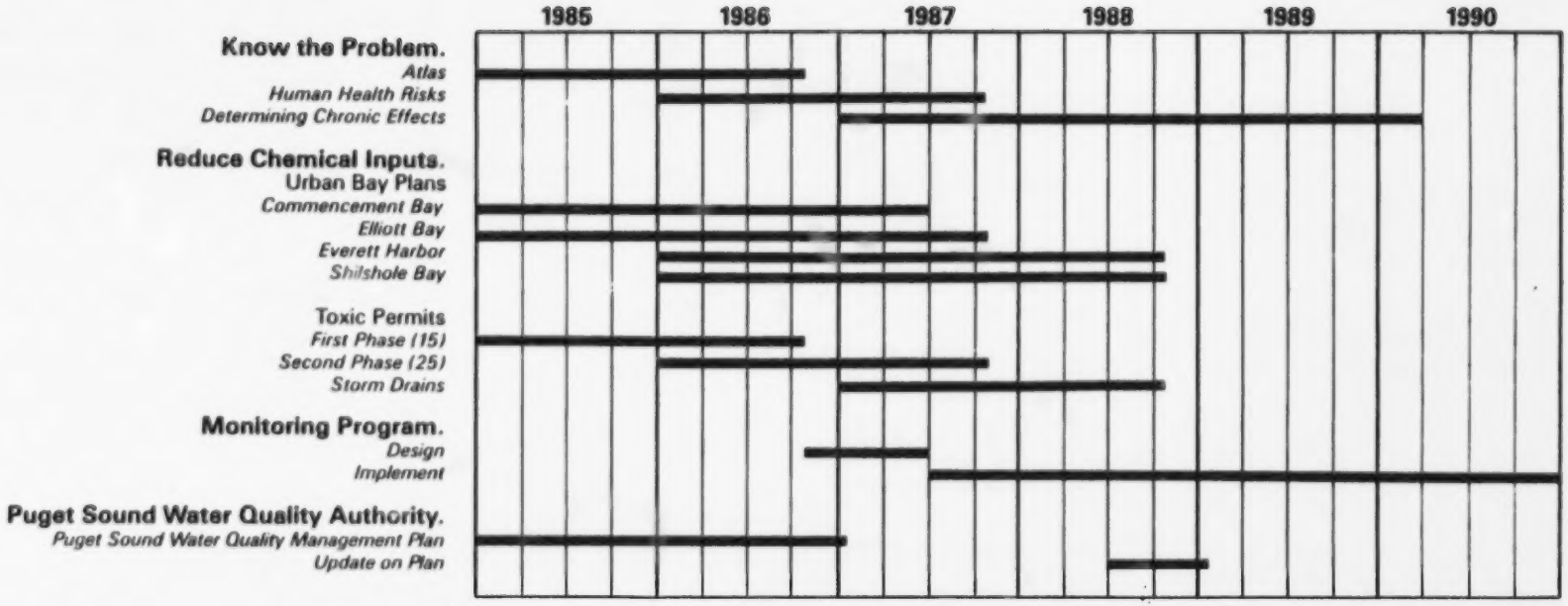
2. Reduce the input of problem chemicals to Puget Sound to safe levels, especially in urban bays.

3. Target compliance and enforcement efforts to reduce and deter inputs of problem pollutants.

4. Design and implement a comprehensive monitoring program.

5. Develop management tools, institutional structure, and long range program support to clean up Puget Sound.

Timeline for Key Activities



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Strategies

OBJECTIVE 1: Know and Understand the Toxicant-Related Problems in Puget Sound as Indicated by Adverse Biological Effects & Bioaccumulation

1-3 Year Objectives	Actions Planned	Schedule	Responsibility	EPA Contact	Progress Indicator
1. In Urban Bays: Conduct sampling and analysis to develop a detailed understanding of the nature, location, extent and severity of toxicant caused problems, problem chemicals and sources.	° Complete Commencement Bay Analysis (Feasibility Study)	4/87	Ecology	B. Courson	Consultant Report
	° Complete Elliott Bay Analysis	10/86	EPA-WD	J. Underwood	Consultant Report
	° Complete Everett Harbor Sampling and Analysis	6/87	EPA-WD	J. Underwood	Consultant Report
	° Complete Shilshole Bay Sampling and Analysis	7/88	EPA-WD	J. Underwood	Consultant Report
	° Complete Sinclair Inlet Sampling and Analysis	7/89	EPA-WD	J. Underwood	Consultant Report
	° Complete Budd Inlet Sampling and Analysis	7/89	EPA-WD	J. Underwood	Consultant Report
2. Map & define the present knowledge of biological effects, chemical concentrations and resources in P.S.	° Complete P.S. Atlas	10/86	EPA/PSDDA/PSWQA	J. Underwood	Atlas
3. Identify the nature and extent of human health risks from consuming P.S. seafood.	° Survey shellfish at commercial & recreational sites, together with sediment chemistry ° Finfish Survey ° Macroalgae Survey ° Health risk assessment based on previous studies ° Followup as appropriate	10/87	DSHS/EPA	J. Underwood	Analysis results Risk assessment
4. Identify if airborne contaminants are a significant contribution to P.S.	° Air emission inventory/ survey ° Reconnaissance air deposition survey		EPA-ATD	G. Abel	Survey Results

Strategies

OBJECTIVE 1: Know and Understand the Toxicant-Related Problems in Puget Sound as Indicated by Adverse Biological Effects & Bioaccumulation

1-3 Year Objective	Actions Planned	Schedule	Responsibility	EPA Contact	Progress Indicator
5. Determine if and where there are chronic effects from chemicals to the biological system.	° Identify best available sensitive indicators, chronic biological tests	2/87	EPA	J. Underwood	Adopted tests
	° Confirm through lab tests	6/88	EPA	J. Underwood	Test results
	° Confirm through on-site tests				Test results
	° Develop protocols				Protocol Manual
	° Initiate field surveys/ monitoring to detect chronic effect	10/88	EPA	J. Underwood	Study Plan, survey
	° Report on chronic effects, likely causes, significance	3/90	EPA	J. Underwood	Atlas update
6. Set interim criteria levels for sediment contamination for dredging disposal & for identifying remedial actions in urban bays.	° Identify co-occurring chemicals that appear to cause biological effects	8/86	PSDDA/EPA	J. Underwood	Consultant Report
	° Associate field measurements of biological effects with chemical levels in sediment.	6/86	PSDDA/EPA	J. Underwood	Consultant Report
	° Set interim criteria for use in urban bay studies	6/87	EPA	J. Underwood	Consultant Report
	° Analyze new data, review interim criteria.	11/88	EPA	J. Underwood	Consultant Report
7. Determine if chemicals in the microlayer are causing biological effects.	° Complete NOAA funded reconnaissance study		NOAA		NOAA Report

OBJECTIVE 2: *Reduce the Input of Problem Chemicals to Puget Sound to Safe Levels, Especially in Urban Bays*

1-3 Year Objective	Actions Planned	Schedule	Responsibility	EPA Contact	Progress Indicator
1. Institute toxic chemical reduction approach to point sources.	• Complete chemicals of concern matrix	7/86	EPA-WD	J. Underwood	Matrix Done
	• Develop overall draft toxic control strategy and approach, to be coordinated with Ecology.	10/86	EPA-WD	J. Underwood	Strategy draft
	• Identify & prioritize initial set (15) of sources for toxics reduction program	7/86	EPA/(Ecology)	H. Geren	Priority List
	• Establish needs & schedules • Identify & prioritize remaining sources for toxics reduction program	12/86			
	• Establish needs & schedule.				
	• For the 15 priority sources: (1) Add biomonitoring requirements to discharger through orders or permits	10/86	EPA-WD	H. Geren	15 dischargers submitting biomonitoring reports
	(2) Add effluent monitoring requirements for priority dischargers through orders or permits	10/86	EPA-WD	H. Geren	15 dischargers submitting effluent monitoring reports
	(3) Add ambient monitoring requirements for priority dischargers through orders or permits	10/86	EPA-WD	H. Geren	15 dischargers submitting ambient monitoring reports
	• As needed, initiate corrective actions	10/87	EPA-WD	H. Geren	Enforcement Actions
	• Assess workload required for toxics control approach and compliance monitoring/ followup	3/87	EPA-WD	H. Geren	Analysis Recommendations
	• Reassess and affirm strategy for toxics controls based upon experience with initial 15 dischargers	10/87	EPA-WD	H. Geren	Strategy

Strategies

OBJECTIVE 2: Reduce the Input of Problem Chemicals to Puget Sound to Safe Levels, Especially in Urban Bays

1-3 Year Objective	Actions Planned	Schedule	Responsibility	EPA Contact	Progress Indicator
	° For the remaining priority sources:				
	(1) Add biomonitoring requirements to discharger through orders or permits	10/87	EPA-WD	H. Geren	Remaining dischargers submitting bio-monitoring reports
	(2) Add effluent monitoring to requirements for priority dischargers through orders or permits	10/87	EPA-WD	H. Geren	Remaining dischargers submitting effluent monitoring reports
	(3) Add ambient monitoring to requirements for priority dischargers through orders or permits	10/87	EPA-WD	H. Geren	Remaining dischargers submitting ambient monitoring reports
	° Develop approach for determining source discharge limits (using consultant work in Commencement Bay)	10/87	EPA-WD	H. Geren	Consultant Report on Remedial Action Plan
	° Modify permits to include chemical units for priority dischargers	1/88	EPA-WD	H. Geren	Permits
2. Develop and implement approach to control toxics from storm drains.	° Develop storm drain approach using work done in remedial investigation by Consultant in Commencement Bay	6/87	EPA-WD	H. Geren	Procedure, Policy, Guidance
	° Identify Class I (priority) storm drain discharges for 12/87 data submittal requirements	6/87	EPA-WD	H. Geren	Priority List
	° Issue guidance for data to be submitted in 12/87	6/87	EPA-WD	H. Geren	Guidance, Memos
	° Apply approach to develop specific orders/permits identified in urban bay plans for Commencement Bay, Elliott Bay and Everett Harbor	12/87	EPA-WD	H. Geren	Permits

OBJECTIVE 2: *Reduce the Input of Problem Chemicals to Puget Sound to Safe Levels, Especially in Urban Bays*

1-3 Year Objective	Actions Planned	Schedule	Responsibility	EPA Contact	Progress Indicator
	(1) Begin processing permit applications	1/88			
	(2) Issue priority permits	6/88			
	° Include controls on storm-water runoff for all NPDES industrial permits for Elliot Bay, Commencement Bay and Everett Harbor as determined necessary	10/88	Ecology/EPA-WD	J. Underwood	Permits
3. Develop & implement approach to control toxics from CSO's per state law HB 815.	° Develop volume reduction strategy per state requirement		Ecology	H. Geren	Strategy
	° Assess application of RCRA requirements	10/87	EPA-WD	H. Geren	Assessment
4. Complete Urban Bay Plans	° Elliott Bay plan complete	10/87	EPA-WD	J. Underwood	° Final Plan
	° Commencement Bay plan	6/87	Ecology/EPA-WD	J. Underwood	° Final Plan
	° Everett Harbor plan complete	10/88	EPA-WD	J. Underwood	° Final Plan
	° Shilshole Bay plan complete	10/88	EPA-WD	J. Underwood	° Final Plan
	° Sinclair Inlet & Budd Inlet plan complete	10/91	EPA-WD	J. Underwood	° Interim Plan
5. Implement Urban Bay Plans through Action Teams (Resource issue with Ecology)	° Elliott Bay plan complete	7/89	Ecology		° Action Team hired & working
	° Commencement Bay plan complete	7/90	Ecology		° Action Team hired & working
	° Everett Harbor plan complete	2/90	Ecology		° Action Team hired & working
	° Shilshole Bay plan complete	10/89	Ecology		° Action Team hired & working
	° Sinclair Inlet & Budd Inlet plan complete	12/92	Ecology		° Action Team hired & working
6. Meet Deadlines For Municipal Compliance Plan	° Confirm priority ranking for municipal STP construction grants on Puget Sound		Ecology/EPA-WD	C. Noah-Nichols	
	° All dischargers at secondary treatment or on legal schedule or in referral process	10/86	Ecology/EPA-WD	H. Geren	Consent decrees
	° Secondary treatment requirements met at all municipalities	6/92	Ecology/EPA-WD	H. Geren	STPs on line

Strategies

OBJECTIVE 2: *Reduce the Input of Problem Chemicals to Puget Sound to Safe Levels, Especially in Urban Bays*

1-3 Year Objective	Actions Planned	Schedule	Responsibility	EPA Contact	Progress Indicator
7. Develop approach for dealing with toxic hot spots including options for solutions and associated data needs, cost estimates, etc., for each option.	• Design and carry out prototype toxic hot spot removal and upland disposal in Commencement Bay to test procedures, technology, and costs	(assistance requested from HQ)	EPA-WD/HQ	J. Underwood	Completion of prototype cleanup
	• Implement appropriate remedial action for priority hot spots				# hot spots cleaned up
8. Institute chemical reduction through dredged material disposal siting and management (PSDDA)	• Identify acceptable open water, unconfined disposal sites	7/87	PSDDA/EPA-WD	M. Lagerloef	EIS
	• Determine interim biological and chemical criteria for defining sediment acceptable for open water, unconfined disposal	7/87	PSDDA/EPA-WD	M. Lagerloef	EIS
	• Develop management plan and responsibility for dredged material disposal and management for open water, unconfined disposal	7/87	PSDDA/EPA-WD	M. Lagerloef	EIS
	• Adopt and implement unconfined dredged material management program	9/87	DNR/Ecology	M. Lagerloef	
	• Develop concept paper & a decision memo for study of alternatives to unconfined disposal			M. Lagerloef	Decision re: study
	• Define procedure and requirements for confined and/or upland disposal			M. Lagerloef	
	• Adopt and implement program for confined and/or upland disposal of contaminated dredged materials			M. Lagerloef	

OBJECTIVE 3: Target Compliance and Enforcement Efforts to Reduce and Deter Inputs of Problem Pollutants

1-3 Year Objective	Actions Planned	Schedule	Responsibility	EPA Contact	Progress Indicator
1. Identify unregulated toxic discharges into PS and bring sources into compliance					
Storm Drains[1]	• Orders for information		EPA-WD		# of orders
	• Field surveys to target sources		EPA-WD	WOO/Parkin	
	• Develop allowable discharge limits or BMP's		EPA-WD	WOO/Parkin	Discharge limits
	• Enforcement		EPA-WD	WOO/Parkin	
	• Eliminate storm drains causing known problems		Ecology	WOO	
Illegal Dumping	• Field surveys to identify sources		EPA-ESD/Criminal Investigators	D. McClary	Indictments/ Convictions
	• Enforcement/Criminal investigations				
Poor Mgmt of Reg. Pesticides (Wood treaters)	• Develop best management practices		EPA-ESD		
	• Provide technical assistance to state		EPA-ESD	B. Schmidt	
	• Compliance inspections		EPA-ESD	B. Schmidt	Inspection Reports
	• Orders; Enforcement		EPA-ESD/ATD/ORC/HWD		
Hazardous Chemical Substances or Mixtures (ex. sandblasters)	• Investigate subpoenas TSCA sec 11(c) served		EPA-ORC	Hamill or Dabroski	# of areas "screened" clean, or "targeted" as dirty
	• Identify chemicals of concern	7/87	EPA-OPS	J. Underwood	List & chemicals
Airborne Contaminants	• Identify priority air sources and contaminant routes	FY 88	ATD	G. Abel	Air emissions of chemicals of concern

[1] These activities are also shown under Objective 2.

Strategies

OBJECTIVE 3: *Target Compliance and Enforcement Efforts to Reduce and Deter Inputs of Problem Pollutants*

1-3 Year Objective		Actions Planned	Schedule	Responsibility	EPA Contact	Progress Indicator
2. Identify toxic dischargers and control/eliminate discharges into PS						Toxics Discharged from reg. sources
	Toxic management approach for NPDES discharges[1]	° Identify & prioritize initial set (15) of dischargers of chemicals of concern	7/86	EPA-WD	WOO	
		° Develop guidance for biomonitoring, ambient monitoring, and chem. discharge measurements	7/86	EPA-WD	H. Geren	
		° Develop state capability to do tests	7/87	EPA-WD	H. Geren	
		° Enforce against majors, sig. minors		EPA-WD		
		° EPA Admin orders as necessary		EPA-WD	WOO/H. Geren	
	Municipal Treatment facilities[1]	° Compliance inspections		Ecology/EPA-WD		
		° Upgrade to secondary		Ecology	WOO	
		° Enforce pretreatment regulations Oversight		Ecology EPA-WD	WOO/H. Geren	
		° Pretreatment compliance inspections in targeted areas		Local Agencies/ EPA-WD	WOO/H. Geren	
		° Enforcement followup		Local Agencies/ EPA-WD	WOO/H. Geren	
3. Develop action plans to control sources, determine sediment remedial actions.		° Elliott Bay Final action plan	6/87	EPA-WD	J. Underwood	Action Plan
		° Commencement Bay action plan	6/87	Ecology	B. Courson	Action Plan
		° Everett Harbor action plan	10/87	EPA/Ecology	J. Underwood	Action Plan

1. These activities are also shown under Objective 2.

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OBJECTIVE 3: *Target Compliance and Enforcement Efforts to Reduce and Deter Inputs of Problem Pollutants*

1-3 Year Objective	Actions Planned	Schedule	Responsibility	EPA Contact	Progress Indicator
4. Clean up existing Hazardous Waste Sites					
	Commencement Bay				
	• Source control program (See Obj. 2 above)			B. Courson	
	• PCB Mitigation Plan	6/87	Ecology		Plan
	• Determine if & where remedial action may be warranted (ROD)	10/87	Ecology/EPA-WD	B. Courson	Report
	• Decision on next phase of superfund project for Comm. Bay	10/87	EPA-HWD	B. Courson	Decision/Recommendation to HQ
	• Enforcement Policy	Completed	Ecology/EPA-HWD		
	• Evaluate remedial actions (FS)		Ecology/EPA-HWD	B. Courson	
	Eagle Harbor (Dependent on making the NPL)				
	• Evaluate data from state survey of Eagle Harbor sediments	6/86	EPA-HWD	B. Courson	Evaluation Report
	• Evaluate data from RCRA enforcement action	7/86	EPA-HWD	B. Courson	Evaluation Report
	• Determine additional data needs, develop workplan to acquire data	8/86	EPA-HWD	B. Courson	
	• Gather additional data, analyze to determine extent of contamination in the harbor, on the Wyckoff property and whether contaminants are migrating off-site	10/87-6/88	EPA-HWD	B. Courson	Report
	• Evaluate need for remedial measures (FS)	6/88-3/89	EPA-HWD	B. Courson	Decision Memo
	• Select and implement remedial measures (ROD)	7/89	EPA-HWD	B. Courson	Recommendations to HQ
	Harbor Island				
	• Approve Phase I of Remedial Investigation Plan (prepared by Ecology)	6/86	Ecology/EPA-HWD	B. Courson	Plan
	• Investigation planned to start	1/87	Ecology/EPA-HWD	B. Courson	
	• Evaluate data from Phase I investigation to determine extent of contamination on Island	6/87	Ecology/EPA-HWD	B. Courson	Report

Strategies

OBJECTIVE 3: Target Compliance and Enforcement Efforts to Reduce and Deter Inputs of Problem Pollutants

1-3 Year Objective		Actions Planned	Schedule	Responsibility	EPA Contact	Progress Indicator
		• Determined need for further investigation (are contaminants migrating off of the Island, affect on biota, etc)	8/87	EPA-HWD	B. Courson	Report
		• Develop Phase II of field survey (same timing as PSEP)	9/87	EPA-HWD	B. Courson	Workplan
		• Analyze data to identify sources, migration pathways, source control requirements, remedial measures (FS)	8/88	EPA-HWD	B. Courson	Report
		• Implement remedial measures	3/89	EPA-HWD	B. Courson	Report
	Strandley	• Excavate & store PCBs, • Excavate & store dioxin • Stabilize/Prevent further migration	1986	PRPs EPA-HWD	B. Courson	
5. Eliminate point source biological contamination	Municipal Treatment facilities	• Compliance inspections		Ecology/EPA		Amt. of specific effluents discharged
		• Upgrade to secondary • Enforce fecal coliform standards • Upgrade inadequate outfalls CSO's • Eliminate raw discharges into Sound Salmon Beach Fort Ward		Ecology	WQO	
	Federal Facilities	• Increase use of environmental auditing at fed. Facilities to detect & solve pollution problems		EPA-WD	C. Smith	# of facilities that are audited
	Septic Tanks	• 205j Projects		DSHS/Ecology/Couties	WQO	
	Agricultural Activities	• 205(j) Projects		SCS/Counties/Ecology	WQO	

OBJECTIVE 4: Design and Implement Comprehensive Monitoring Program

1-3 Year Objective	Actions Planned	Schedule	Responsibility	EPA Contact	Progress Indicator
1. Design monitoring program to meet management needs for the Sound	° Propose monitoring program options--complete Contractor Study	11/86	EPA/PSWQA	J. Underwood	Contractor
	° Preferred option selected; Monitoring program adopted with assigned roles and funding	6/87	PSWQA	J. Underwood	PSWQA Plan Include in FY 88 SEA
2. Implement monitoring program	° Field sampling underway per design	6/87		J. Underwood	
	° Routine evaluation of data and reports distributed	1/88			
	° Atlas and State of the Sound in biannual updates to reflect monitoring results	1/89			

Strategies

OBJECTIVE 5: Develop Management Tools, Structure, and Long Range Program Support to Clean Up Puget Sound

1-3 Year Objective	Actions Planned	Schedule	Responsibility	EPA Contact	Progress Indicator
1. Develop a plan to address a long term cause/effect model	° Evaluate the NOAA funded source/fate/effects model	1/88	EPA-WD	J. Underwood	Evaluation & Recommendation
	° Evaluate other parallel efforts in system understanding and representation	1/88	EPA-WD	J. Underwood	Evaluation & Recommendation
	° Initiate development of a pollutant loading data base	6/87	EPA-WD	H. Geren	
	° Identify objective needs for use of model in PS	10/87	PSEP	J. Underwood	Recommendation
2. Develop and implement management tools that promote more efficient and effective management	° Establish and Implement standard protocols for more consistent and reliable data collection and analysis	10/86	EPA-WD	J. Underwood	notebook available by 10/86
	° Establish a PS regional Data Management system to facilitate data exchange and data analysis		PSWQA/EPA-WD	J. Underwood	Format agreement Data bibliography established
3. Establish and implement a Puget Sound Institute to focus/coordinate long-term Puget Sound research at the University of Washington	° Fund Post-doctoral work	8/86	U of W/EPA	J. Underwood	Cooperative Agreement
4. Foster public understanding of and participation in PS initiatives through development and implementation of public outreach programs	° Maintain citizen advisory committees for urban bays	Ongoing, each bay	OPS	J. Underwood	
	° Maintain traveling exhibit funded by Science Center	7/86	OPS	J. Underwood	Cooperative Agreement
	° Support Adopt-a-Beach Program	7/86	OPS	J. Underwood	Cooperative Agreement

Glossary of Abbreviations

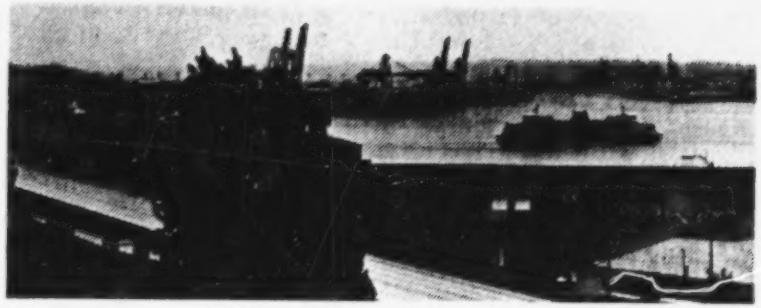
Amt:	Amount
CSO:	Combined Sewer Overflows
DNR:	Washington State Department of Natural Resources
DSHS:	Washington State Department of Social and Health Services
Ecology:	Washington State Department of Ecology
Enf:	Enforcement
F.S.:	Feasibility Study
HB 815:	House Bill 815
EPA-ATD:	Region 10's Air and Toxics Division
EPA-ESD:	Region 10's Environmental Services Division
EPA-HWD:	Region 10's Hazardous Waste Division
EPA-OPS:	Region 10's Office of Puget Sound
EPA-ORC:	Region 10's Office of Regional Council
EPA-WD:	Region 10's Water Division
NOAA:	National Oceanic and Atmospheric Administration
NPL:	National Priority List
PCBs:	Polychlorinated Biphenyls
PRPs:	Principle Responsible Parties
PS:	Puget Sound
PSDDA:	Puget Sound Dredge Disposal Analysis
PSEP:	Puget Sound Estuary Program
PSWQA:	Puget Sound Water Quality Authority
Reg:	Regulated
R.I.:	Remedial Investigation
R.O.D.:	Record of Decision
SCS:	U.S. Soil Conservation Service
SEA:	State, EPA Agreement
STP:	Sewage Treatment Plant
Subs:	Substances
TSCA:	Toxic Substances Control Act
WOO:	Region 10's Washington Operations Office
U of W:	University of Washington

Headquarters Actions Needed

During the past few years, Region 10 has made substantial progress toward developing an improved understanding of the impact of man's activities on the water quality and biological resources of Puget Sound. Enhanced control of many pollutants through implementation of pretreatment and wastewater permitting requirements, and installation of municipal and industrial waste treatment facilities have gone a long way toward controlling water pollution, protecting marine fish and shellfish, and minimizing the risks to public health. Information generated by the urban bay and system-wide studies have enhanced the region's ability to characterize the current health of the Sound and to understand the impact of human activities on estuarine environmental quality.

As evidenced in the foregoing sections, Region 10 is employing a variety of techniques in addressing Puget Sound environmental problems. Through coordinated efforts, the region is striving to develop a comprehensive program which involves a near-term search for solutions to current environmental and management problems, together with enhanced long-term research and monitoring to improve predictive capabilities.

Support of the Puget Sound program requires extensive commitment, both in terms of staff and funding requirements. Current resource limitations prevent the Region from undertaking all of the activities that have been identified as critical to maintaining the quality of the Sound. More extensive involvement by headquarters in certain aspects of the program may be necessary to achieve the program's goals. Headquarters' assistance in the following areas makes sense not only because these efforts will directly benefit the region, but more importantly because the products which result will have utility nationwide. Headquarters' assistance is requested for the following activities:



I. Support for Toxic Control Activities

Source control of toxic discharge to the Sound is our top priority. We are aggressively moving forward in instituting additional biomonitoring and chemical monitoring requirements on permittees, and preparing for limiting specific toxic chemical discharges. We are finding that assistance will be extremely important to us in making this approach work. Key areas are listed below.

- Develop permittee biomonitoring requirements (i.e., technical basis, policy guidance, recommended protocols).
- Provide training support for state agency staff concerning enhanced chemical and biological monitoring requirements.
- Provide funding support to state agencies for enforcement and toxics source control efforts in Puget Sound (i.e., 104b funds).
- Provide resources/technical support for development of approach to storm drain and CSO permitting and development of models for storm drain and CSO permits.

- Provide resources/technical assistance for the development of an approach to establish permit discharge limits for toxics in urban bays.

- Provide resources/technical assistance in developing tools for tracing pollutants from sources to deposition areas (i.e., "finger-printing techniques".

II. Support for the Development of Regional Sediment Criteria

The Action Plans for the urban bays will be founded upon interim sediment criteria to seek the basis for source reductions, remedial actions and priority setting. These interim criteria will be needed in FY 87, far in advance of the headquarters criteria setting schedule.

Additionally, substantial field cause and effect data is being collected as part of the characterization effort in each urban bay. This data will be useful in associating chemicals to biological effects and helping us determine fruitful next steps in establishing interim criteria. Two suggestions are offered for enhancing work in this area:

- Better coordination and support between the regional and headquarter sponsored efforts to develop criteria for use in the management of contaminated marine sediments. Specifically, allocating some criteria/standards funds to Region 10 to carry out parts of the sediment criteria appropriate to Puget Sound urban bay work would add to the technical basis of our work and more effectively build support into the national effort.

- Provide funding/technical assistance to support development of an approach to establish discharge limits which will prevent exceeding interim sediment quality values.

III. Support for Development of Enhanced Biomonitoring Tools

Key to the success of the toxic control approach is the ability to measure biological effects, particularly at the chronic level. We are finding this to be extremely limiting to us as we move forward. There do not appear to be good chronic tests available, particularly with critters native to Puget Sound. We have excellent scientists and facilities to work in this area (University of Washington, EPA's Newport Lab, etc.) but lack funding support.

- Provide funding/technical assistance for the development of chronic bioassays for use in testing a variety of media.

- Provide funding/technical support for the identification of pollution sensitive west coast species which can be used in ambient and biomonitoring.

IV. Support for Toxic Hotspot Remedial Action Pilot Project

An important element of the long term solution of Puget Sound toxics problems is what to do with

the toxic hot spots in the urban bays. One option is to physically remove the more severely contaminated hot spots and dispose of them upland in properly managed sites. Commencement Bay superfund site has both the "hot spots" and upland sites in close proximity. A demonstration project would provide regional and national information on procedures, concerns, costs and other facets of this option.

- Provide funding to support a dredging demonstration project for the removal of an urban bay toxic hotspot with disposal in a confined or upland site.

V. Enforcement Referrals

Regional resources currently involved in extensive enforcement referral support could be better used in field work on the toxics control strategy. Streamlining the referral process offers great opportunity for improved use of limited staff, increased regional morale and more effective and expeditious enforcement actions.

- Streamline the enforcement referral process by allowing the Region to tailor the level of referral support on a case-by-case basis as opposed to a standard level of support for all cases.

VI. Opportunities for Loaned Staff from Headquarters

Both the Region and Headquarters could benefit from a Headquarters rotational assignment to the field. Specific areas where extra staff would be of assistance include:

- Writing NPDES permits
- Writing 308 letters
- Helping with enforcement actions
- Providing assistance in writing defensible biomonitoring requirements into permits

VII. Increase Commitment for Regional Staff

Currently the Office of Puget Sound (OPS) has four position with only one position supported by Headquarters. The additional three positions have been supported by the Region. With the anticipated cutbacks in FY'87, funding may no longer be available to cover the three positions. Headquarters support for these positions would ensure that OPS successfully implements the Environmental Action Program for Puget Sound.

References

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- Comprehensive Monitoring of Puget Sound
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- Industrial and Municipal Dischargers
- Industrial Pretreatment
- Nonpoint Source Pollution
- Oil Spill Response
- Public Involvement in Water Quality Policy Making

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